

PROCESS USING POLY-BUFFERED STI

ABSTRACT OF THE DISCLOSURE

5 A method of providing a substantially planar trench  
isolation region having substantially rounded corners, ,  
said method comprising the steps of: (a) forming a film  
stack on a surface of a substrate, said film stack  
comprising an oxide layer, a polysilicon layer and a  
10 nitride layer; (b) patterning said film stack to form at  
least one trench within said substrate, wherein said  
patterning exposes sidewalls of said oxide layer,  
polysilicon layer and nitride layer; (c) oxidizing the at  
least one trench and said exposed sidewalls of said oxide  
15 layer and said polysilicon layer so as to thermally grow  
a conformal oxide layer in said trench and on said  
exposed sidewalls of said oxide layer and said  
polysilicon layer; (d) filling said trench with a trench  
dielectric material; and (e) planarizing to said surface  
20 of said substrate.